Fractional Exponents and Radicals

Lesson 5

Connect

Fractional Exponents

Powers with Rational Exponents with Numerator 1

When *n* is a natural number and *x* is a rational number, $x^{\frac{1}{n}} = \sqrt[n]{x}$

In Math 9, you learned that for powers with integral (same) bases and whole number exponents.

$$a^m \times a^n = a^{m+n}$$

We can extend this law to powers with fractional exponents with numerator (top number) 1.

$$a^{\frac{1}{2}} \times a^{\frac{1}{2}} = a^{\frac{1}{2} + \frac{1}{2}}$$

Jan 30-4:12 PM

Jan 30-4:17 PM

Connect

Fractional Exponents

Powers with Rational Exponents with Numerator 1

When *n* is a natural number and *x* is a rational number, $x^{\frac{1}{n}} = \sqrt[n]{x}$

We can extend this law to powers with fractional exponents with numerator (top number) 1.

$$\left(a^{\frac{1}{2}} \times a^{\frac{1}{2}} = a^{\frac{1}{2} + \frac{1}{2}}\right)$$

 $a^{\frac{1}{2}} = \sqrt{a}$ which means they are equivalent

also, $a^{\frac{1}{3}} = \sqrt[3]{a}$ and the pattern continues

POWERS WITH RATIONAL EXPONENTS

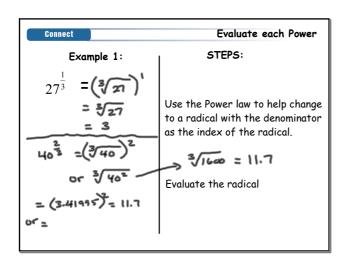
When "m" and "n" are natural numbers, and x is a rational number.

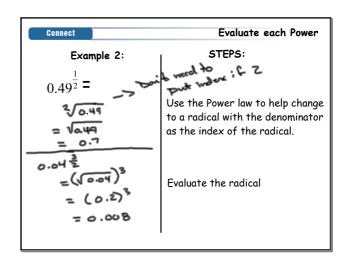
$$x_{\frac{1}{N}} = \left(\sqrt{x}\right)_{N}$$

and
$$x_{\frac{1}{N}} = (x_{\frac{1}{N}})_{\frac{1}{N}}$$

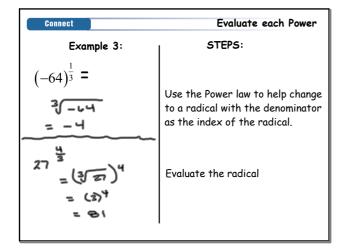
$$= (\sqrt{x})_{\frac{1}{N}}$$

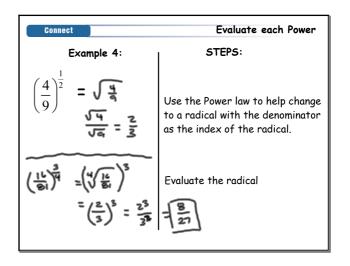
$$x_{\frac{1}{N}} = (x_{\frac{1}{N}})_{\frac{1}{N}}$$



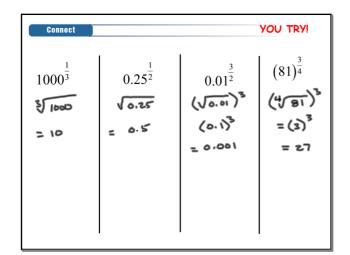


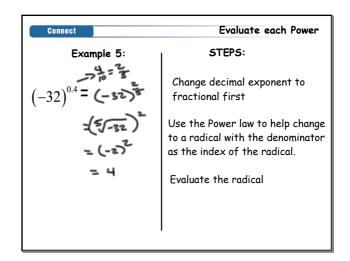
Jan 30-4:17 PM Jan 30-4:17 PM





Jan 30-4:17 PM Jan 30-4:17 PM





Jan 30-4:17 PM Jan 30-4:17 PM

